

**Notice of Allowability****Application No.**

10/578,337

**Applicant(s)**

PARISIS ET AL.

**Examiner**

AVINASH YENTRAPATI

**Art Unit**

2624

**- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/20/2009.
2. ☒ The allowed claim(s) is/are 1-14.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying Indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 12/18/2010.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_.

/AVINASH YENTRAPATI/  
Examiner, Art Unit 2624

**DETAILED ACTION**

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee. **Claims 1, 8, 11-12 and 13-14 have been amended. Claim 15 is cancelled. Claim 14 has been amended to depend from claim 8 instead of claim 10.**

Authorization for this examiner's amendment was given in a telephone interview with Gerald Helget on 2/18/2010.

**Claims 1, 8, 11-12 have been amended as follows:**

**Claim 1:** A method of inserting a watermark composed of a plurality of binary information in an image comprising at least three components, the method comprising of:

decomposing at least one component of the image into detail sub-bands in various directions and comprising coefficients, each coefficient being characterized by its position in the detail sub-band to which it belongs and its amplitude;

determining, for each position, information representing local amplitude variations in various directions from amplitudes of the coefficients at the position in the various detail sub-bands and coefficients close to the position in the various detail sub-bands;

determining, a watermarking strength at each position from information representing local amplitude variations in various directions determined for the position;

forming, for each position and for each decomposed component, a vector whose coordinates are the amplitudes of the coefficients at the position in the various detail sub-bands of the component;

selecting, for each position, one vector amongst the vectors formed for the position;

watermarking the image by modifying, for each position, the amplitude of the coefficients which are the coordinates of the vector selected for the position according to the binary information corresponding to the position and according to the watermarking strength determined for the position.

**Claim 8:** A method of detecting a signature inserted in an image comprising at least three components, comprising the steps of:

decomposing at least one component of the image into detail sub-bands in various directions and comprising coefficients, each coefficient being characterized by its position in the detail sub-band to which it belongs and its amplitude;

determining, for each position, information representing local amplitude variations in various directions from amplitudes of the coefficients at this position in the various detail sub-bands and coefficients close to this position in the various detail sub-bands;

forming, for each position and for each decomposed component, a vector whose coordinates are the amplitudes of the coefficients at the position in the various detail sub-bands of the component;

determining, for each position, a vector comprising some binary information amongst the vectors formed for the position, and determining of inserted binary information;

detecting the signature from at least some binary information inserted in a plurality of positions in the image and information representing local amplitude variations in various directions corresponding to the binary information.

**Claim 11:** A device for inserting a watermark composed of a plurality of binary information in an image comprising at least three components, the device comprising:

means of decomposing at least one component of the image into detail sub-bands in various directions and comprising coefficients, each coefficient being characterized by its position in the detail sub-band to which it belongs and its amplitude;

means of determining, for each position, information representing local amplitude variations in various directions from amplitudes of the coefficients at the position in the various detail sub-bands and coefficients close to the position in the various detail sub-bands;

means of determining a watermarking strength at each position from information representing local amplitude variations in various directions determined for the position;

means of forming, for each position and for each decomposed component, a vector whose coordinates are the amplitudes of the coefficients at the position in the various detail sub-bands of the component;

means of selecting, for each position, one vector amongst the vectors formed for the position;

means of watermarking the image by modifying, for each position, the amplitude of the coefficients which are the coordinates of the vector selected for the position according to the binary information corresponding to the position and according to the watermarking strength determined for the position.

**Claim 12:** A device for detecting a signature inserted in an image comprising at least three components, the device comprising:

means of decomposing at least one component of the image into detail sub-bands in various directions and comprising coefficients, each coefficient being characterized by its position in the detail sub-band to which it belongs and its amplitude;

means of determining, for each position, information representing local amplitude variations in various directions from amplitudes of the coefficients at this position in the various detail sub-bands and coefficients close to this position in the various detail sub-bands;

means of forming, for each position and for each decomposed component, a vector whose coordinates are the amplitudes of the coefficients at the position in the various detail sub-bands of the component;

means of determining, for each position, a vector comprising some binary information amongst the vectors for the position, and determining of inserted binary information;

means of detecting the signature from at least some binary information inserted in a plurality of positions in the image and information representing local amplitude variations in various directions corresponding to the binary information.

Authorization for this examiner's amendment was given in a telephone interview with Gerald Helget on 2/25/2010.

**Claims 13-15 have been amended as follows:**

**Claim 13:** A computer program stored on ~~an information~~ computer-readable medium, said program containing instructions for implementing the watermarking method as claimed in claim 1, when it is loaded into and executed by a computer system.

**Claim 14:** A computer program stored on ~~an information~~ computer-readable medium, said program containing instructions for implementing the detection method as claimed in claim ~~40~~ 8, when it is loaded into and executed by a computer system.

**Claim 15: (Cancelled)**

***Allowable Subject Matter***

2. Claims 1-14 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

**Re Claim 1, 8, 11-12:**

Kwon discloses decomposing at least one component of the image into detail sub-bands in various directions and comprising coefficients, each coefficient being

characterized by its position in the detail sub-band to which it belongs and its amplitude, determining, for each position, information representing local amplitude variations in various directions from amplitudes of the coefficients at the position in the various detail sub-bands and coefficients close to the position in the various detail sub-bands, determining, a watermarking strength at each position from information representing local amplitude variations in various directions determined for the position (See Rejection for claims 8-10).

However, Kwon and other related prior art fails teach *forming, for each position and for each component, a vector whose coordinates are the amplitudes of the coefficients at the position in the various detail sub-bands of the component, selecting, for each position, one vector amongst the vectors formed for the position, watermarking the image by modifying, for each position, the amplitude of the coefficients which are the coordinates of the vector selected for the position according to the binary information corresponding to the position and according to the watermarking strength determined for the position*. Kwon in combination with any other prior art fails to disclose inserting watermark in a color image by selecting and using a single vector comprising amplitudes in each sub-band using information pertaining to amplitude variations in each sub-band.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AVINASH YENTRAPATI whose telephone number is

(571)270-7982. The examiner can normally be reached on Monday through Thursday, 7:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yubin Hung can be reached on 5712727451. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AVINASH YENTRAPATI/  
Examiner, Art Unit 2624

/Yubin Hung/  
Primary Examiner, Art Unit 2624